Meeting title: "Meso-scale Plasma Dynamics and Energetic Particles: Applications to laboratory, space, and astrophysical plasmas"

Date: June 30-July 1, 2014
Location: Challenge Conference Room (TA-3, Bdg. 200, Room 256)

Theme:
The dynamics of collisionless plasmas features abundant physical processes over a wide range of space and time scales. At the mesoscale, macroscopic phenomena are coupled to and supported by kinetic physics at small scales. This close interaction facilitates rapid energy exchange between particles and electromagnetic fields, leading to strong plasma heating and particle acceleration. In recent years, significant progress has been made in observations, theories and numerical simulations in different plasma environments such as laboratory plasmas, Earth's magnetosphere, the heliosphere, and astrophysical objects. Our objective is to organize a forum for plasma physicists from a range of background at LANL and from outside to discuss latest progress on plasma dynamics and the generation of energetic particles in the mesoscale regime and foster future collaborations.

Key Scientific Issue:
Theoretical understanding and numerical modeling of multi-scale plasma phenomena is challenging and this forum promotes development of theories, models and numerical techniques to bridge the macroscopic and microscopic physics in plasmas, with emphasis on energetic particles.

SOC:
Fan Guo (co-Chair, T-2, LANL)
Xiangrong Fu (co-Chair, ISR-1, LANL)
Pat Harding (P-23, LANL)
Cihan Akcay (P-24)
Yi-Hsin Liu (T-2, LANL)
William Daughton (XCP-6, LANL)
Hui Li (T-2, LANL)

Confirmed Speakers:
Jay Albert (Airforce Albuquerque)
Lunjin Chen (UT Dallas)
Lan Gao (PPPL)
Joe Giacalone (U of Arizona)
Gang Li (U of Alabama in Huntsville)
Kirit Makwana (U of Chicago)
Joseph Mcclenaghan (UCI)
Peera Pongkitiwanichakul (U of Chicago)

Scientific Program: (Coming soon)

Sessions (preliminary):

Overview

Large-scale dynamics
Small-scale plasma physics
Connecting Large-scale and small-scale
Energetic Particles
High-energy emissions

Reconnection

Observation of reconnection
Observation of energetic particle associated with reconnections solar flares
Theory of energetic-particle acceleration
Simulation

Shocks

Shock structure and dynamics of low-energy particles
Observations of Energetic Particles associated with shock waves

Turbulence

Observation of magnetic turbulence
Kinetic Modeling of magnetic turbulence
Cosmic Ray transport in magnetic turbulence
Effect of Energetic Particles on turbulence

Waves

Wave generation
Wave scattering and particle acceleration

Laser and fusion plasmas

Laser-driven plasma instabilities

Energetic Particles and High-energy emissions

Energetic particles in magnetosphere
Energetic particles in the heliosphere
High-energy cosmic rays
High-energy emissions from AGN jets, gamma-ray bursters, and pulsars